

THE IDENTIFICATION OF INDIAN BUTTERFLIES.

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(Continued from page 747 of Volume XXVIII, No. 3).

(With nine black and white plates).

A. Papilionidæ.—The Swallowtails. Genera Key.

- 1a (12a). F v9 present. H with precostal cell.
 1b (10a). F v9 from about upper end of cell. F spur near base from mv towards v1.
 1c (9). Palpi short, pressed against face.
 1d (8). F v9 strongly bowed down at origin, not near or parallel to v10.
 1e (3a). H v8 short, not nearly as long as v1 F. Larva on *Aristolochia* and is covered with many large hairy tubercles. Thorax below red.
 1 (2). F v11 long, from opposite the origin of v2. Large, heavy body, mostly yellow. Head black with narrow red collar. H more or less shining yellow ♂ with anal valves and scent organ H well developed.
Troides, *Hub.*—*The Birdwings*. (Plate 1).
 2 (1). F v11 from opposite the origin of v3. Head red.
Byasa, *M.*—*The Red-bodied Swallowtails*. (Plate 1).
 3a (1e). H v8 as long as v1 F. Larva never on *Aristolochia*. Except for A4/4 head and body never red.
 3b (5a). F v11 free from v12. ♂ no scent organ; anal valves prominent.
 3 (4). Larva with many spiny tubercles; pupa stick like. H v7 either very near v8 or v6, F v2 bowed. Tailless. Head white spotted; abdomen below black and white spotted.
Chilasa, *M.*—*The Mimes*. (Plates 1 and 2).
 4 (3). Larva practically smooth. H v7 about midway between v8 and v6; dcv 7-6 straight or nearly so. F v2 rarely bowed.
Papilio, *L.*—*The Black-bodied Swallowtails*. (Plates 2-5).
 5a (3b). F v11 anastomosed to v12. ♂ anal valves prominent and scent organ usually present. Antennæ scaled above. Pupa four-sided; larva smooth. Abdomen black striped below.
 5b (7). H tailed or produced; v7 midway between v8 and v6.
 5 (6). H tail long, slender, white edged. Above mostly white or pale greenish, with black stripes F.
Pathysa, *M.*—*The Swordtails*. (Plate 5).
 6 (5). H tail short, stout and black or absent. Apex F and tornus H much produced. Mostly black with green bands and spots.
Zetides, *M.*—*The Bluebottles and Jays*. (Plate 5).
 7 (5b). H. rounded, tailless; v7 much nearer v8 than v6.
Paranticopsis, *DeN.*—*The Zebras*. (Plate 6).
 8 (1d). F v9 straight at origin, close to and parallel to v10; v11 free. F highly falcate. Claw of tarsi with a tooth in or behind the middle. With scent organs and anal valves.
Meandrusa, *M.*—*The Gorgons*. (Plate 6).
 9 (1c). Palpi long, porrect. F v6 much nearer v7 than v5. No scent organ or anal valves.
Teinopalpus, *Hope.*—*The Kaiserihind*. (Plate 6).
 10a (1b). F v9 from well beyond end cell. No anal valves.
 10 (11). F v9 out of v8, which meets v7 at end cell. H cell very small. Antennæ longer than cell. H produced to a long tail. F outer half clearwing.
Leptocircus, *Swain.*—*The Dragontails*. (Plate 6).
 11 (10). F v9 and v8 out of v7; v6 and v7 approximate.



A. Papilionidae. 1. *Troides*: 2. *Byasa*: 3. *Chilasa*.

A. Papilionidiæ.—The Swallowtails. Genera Key—contd.

Armandia, Blanch.—*The Bhutan Glory*.

12 a (1a). F v9 absent; no spur from mv. H no precostal cell.

12 (13). H v8 shorter than v1 F. F v10 and 7 from a point.

Antennæ club short, abrupt and flattened.

Hypermnestra, Men.—*The Desert Apollos*. (Plate 6).

13 (12). H v8 longer than v1 F. F v10 and 7 well separated at origin.

Antennæ club gradually elongate and rounded. ♀ with horny pouch.

Parnassius, Lat.—*The Snow Apollos*. (Plate 6).

A1. Troides.—The Birdwings. (Plate 1).

1a (3a). H space 1 black. 1b (5). ♂ upf no yellow.

1 (2). H cell mostly black.

darsius, Gray. (140-160). The Ceylon Birdwing, Ceylon, C.

♂ v. *cambyses*, Ehr. With discal spots H. R.

2 (1). H cell mostly yellow.

minos, Cr. (140-190). The Malabar Birdwing, South India. NR.

3a (1a). H space 1 mostly yellow in ♂; ♀ at least a yellow spot in middle; cell mostly yellow.

3 (4). ♂ all space 7 H yellow; ♀ base space 1 black.

caucus, Fd. (150-170). The Golden Birdwing. Garhwal—Burma, NR.

4 (3). ♂ space 7 H black at base; ♀ base space 1 yellow. α. Larger and paler.

helena cerberus, Fd. (140-170). The Common Birdwing. Sikkim—Burma C.

*v. *eumagos*, Jord. Upf whiteish vein stripes absent. NR.

β. Smaller and darker.

helena heliconoides, M. (130-160). The Andaman Birdwing. Andamans, C.

♂ v. *aphnea*, Jord. Upf with whiteish vein stripes. R.

5 (1b). ♂ upf prominent yellow (♀ white) area about end cell.

amphrysus ruficollis, But. (130-160). The Malay Birdwing. Mergui. VR.

A2. Byasa.—The Red-bodied Swallowtails. (Plate 1).

1a (5a). Tailless. ♂ anal valves and scent organ prominent. No red markings. Abdomen below red, black banded (except No. 4).

1b (3a). Uph no pale area.

1 (2). ♂ uph dorsal fold rounded and lower half scent area white. Upf pale streaks visible in cell. ♀ above brown. Abdomen broad white stripe at side and head pinkish white.

aidoneus, Db. (100-120). The Lesser Batwing. Garhwal—Shan States. R.

2 (1). ♂ uph dorsal fold square and scent area only with a small white patch. ♀ shining black. Abdomen red stripe at side and head red.

α. ♂ unf no white stripes before margin. ♀ pale area near tornus upf and stripes dusted over and suffused.

varuna astorion, Wd. (90-130). The Common Batwing. Kumaon—Tavoy NR.

β. ♂ unf white stripes before margin. ♀ upf pale tornal area pure white and sharp defined.

varuna varuna, White. Mergui—S. Burma. R.

3a (1b). Uph outwardly with a pale area.

3 (4). Uph ♂ submarginal white patches space 2-4; ♀ large white discal area from dorsum to space 5.

**zaleucus*, Hew. (80-110). The Burmese Batwing. Shan States—S. Burma-NR.

♂ v. *punctata*, Evans. White area black spotted. R.

4 (3). Uph outer half blue grey with black spots. Body yellow, black spotted. Head white. ♂ dorsal fold uph white, with red margin.

A2. Byasa.—The Red-bodied Swallowtails. (Plate 1)—contd.

sycorax, Gr. S. (110-130) The Whitehead Batwing. Mergui. VR.

5a (1a). Tailed.

5b (8a). Tail long, spatulate, with very narrow neck. ♂ anal valves prominent, open above; scent organ ill developed.

5c (7). Tail black.

5 (6). Uph no white spots; a rather pale red discal area from space 1-4. Head black; outer half abdomen all yellow.

neptunus, Guer. (100-120). The Yellow-bodied Clubtail. Tavoy—S. Burma. VR.

6 (5). Uph with white spots. Abdomen red and black; head red. F long and narrow. H outer half of cell white.

a. Uph white spots beyond cell extensive and complete.

coon cacharensis, But. (100-120). The Common Clubtail. Assam. NR.

β. Uph white spots more restricted.

**coon doubledayi*, Wall. Burma. C.

γ. Uph red spots near margin in space 3 united.

coon sambilanga, Doh. Nicobars. R.

7 (5c). Tail red. Uph no discal spots in 3, 4 or 7.

rhodifer, But. (120-140). Andamans. The Andaman Clubtail, NR.

8a (5b). Tail gradual, neck not narrow. Head and abdomen below mostly red.

8b (11a). ♂ no anal valves and scent organ ill developed. Unh complete row 7 red spots.

8 (9a). Uph outer half at least of cell white and complete row of large discal spots beyond.

a. Upf outer white area prominent; no black stripes in 2 and 3; pale stripes do not enter cell.

jophon jophon, Gray. (110-130). The Ceylon Rose. Ceylon. R.

β. Upf all black stripes complete and pale stripes enter cell.

jophon pandiyana, M. (100-130). The Malabar Rose. S. India. R.

9a (8). Uph at most a small white spot end cell.

9 (10). Uph discal and submarg row red spots. Upf prominent white central and apical band.

hector, L. (90-110). The Crimson Rose. Ceylon—Bengal. C.

10 (9) Uph white discal spots in 2-5, some of which may be absent.

a. Uph usually white spot end cell; discal spots prominent and pressed up against cell. Unh discal spot in 1 white.

aristolochia ceylonicus, M. (80-110.) The Common Rose. Ceylon, VC.

β. Uph rarely spot in cell; unh spot in one mostly red. Typical form with spots remote from cell and incomplete.

aristolochia aristolochia, F. India. VC.

v. *diphilus*, Esp. discal spots complete and against cell.

γ. Discal spots often red edged. Unh discal spot in 1 often red. Only *diphilus* form seems to occur.

aristolochia goniopeltis, Roth. Burma. VC.

δ. Typical form with the discal spots reduced to 2 obscure ones in 1 and 2, *diphilus* form also occurs.

aristolochia camorta, M. Nicobars. VC.

11a (8b). ♂ with anal valves and scent organ well developed. Uph no white in cell.

11b (17a). Uph with discal white spot or spots.

11c (14a). Uph white discal spots 2-4 or 5 and submarginal spots 2-5.

11 (12a). Tail black. Uph submarginal spots in 4 and 5 white and that in 5 often joined to discal spot. Unh submarginal spot in 6.

adamsoni, Gr. S. (90-110). Adamson's rose. Shan States—Dawnas. R.

12a (11). Tail red tipped.

A2. Byasa.—The Red-bodied Swallowtails. (Plate 1)—contd.

12 (13). H cilia black from tornus to v3.

a. ♂ uph no discal spot in 5. ♂ spot in 5 small, only half way to v6.

latreillei latreillei, Don. (110-130). The Rose Windmill. Garhwal—Sikkim. R

β. Uph white spot in 5 reaches v6, but does not fill base of space 5.

**latreillei kabrua*, Tyl. Assam—N. Burma. R.

13 (12). H cilia red from tornus—v3, Uph discal white spot in 5 large and fills base of space 5.

polla, DeN. (110-130). DeNiceville's Windmill. Assam—N. Burma. VR.

14a (11c). Uph very large discal but no submarginal spot in 5; those in 2, 3 and 4 prominent.

14 (15a). H tail black. Uph large white spot in 6 and small one in 7.

nevilli, Wm. (100-120). Nevill's Windmill. Assam. VR.

15a (14). H tail red tipped.

15 (16). Uph submarginal spot in 4 red; no spot in 6. Unh small discal white spot in 4, often visible above.

a. Below body blacker.

**philoxenus philoxenus*, Gray. (110-130). The Common Windmill. Kashmir—Nepal. NR.

β. Below body almost entirely red. Larger.

philoxenus polyeuctes, Db. (120-140). Sikkim—Burma. C.

16 (15). Uph submarginal spot in 4 mostly red.

Uph nearly always white spot in 6. ♀ uph discal white spot in 1-2 above brown; outer half H black.

dasarada ravana, M. (100-130). The Great Windmill. Kashmir—Kumaon. NR.

β. Uph very rarely discal white spot in 6. ♀ uph no discal white spot in 1-2; above entirely black, but females of the *ravana* type occur as rare varieties.

dasarada dasarada, M. (120-140). Sikkim—Assam. NR.

γ. Wings narrower. Unh paler from cell to costa and spot in 6 absent.

dasarada barata, Roth. (120-140). Burma. R.

17a (11b). Uph no white discal spots.

17 (18). Above unmarked. Unh tail red tipped; red discal spots from 1-2 and submarginal spots to 5, which may show very obscurely above.

crassipes, Ob. (110-120). The Black Windmill. Manipur—Shan States. VR.

18 (17). Tail black. Unh submarginal red spots to 6.

a. Uph complete row nearly white submarginal spots 2-6.

alcinuous pembertonii, M. (100-120). Pemberton's Chinese Windmill. Sikkim—Bhutan. VR.

. Uph prominent black submarginal spots and small red submarginal spot in 2. ♀ pale brown, obscure traces of submarginal red spots 3-6.

alcinuous tyleri, Evans. Tytler's Chinese Windmill. Manipur. R.

A3. Chilasa.—The Mimes. (Plates I-2).

1a (4a). H v7 twice as far from v8 as from v6. End cell very rounded.

1b (3). Above pale blueish or grey with black veins.

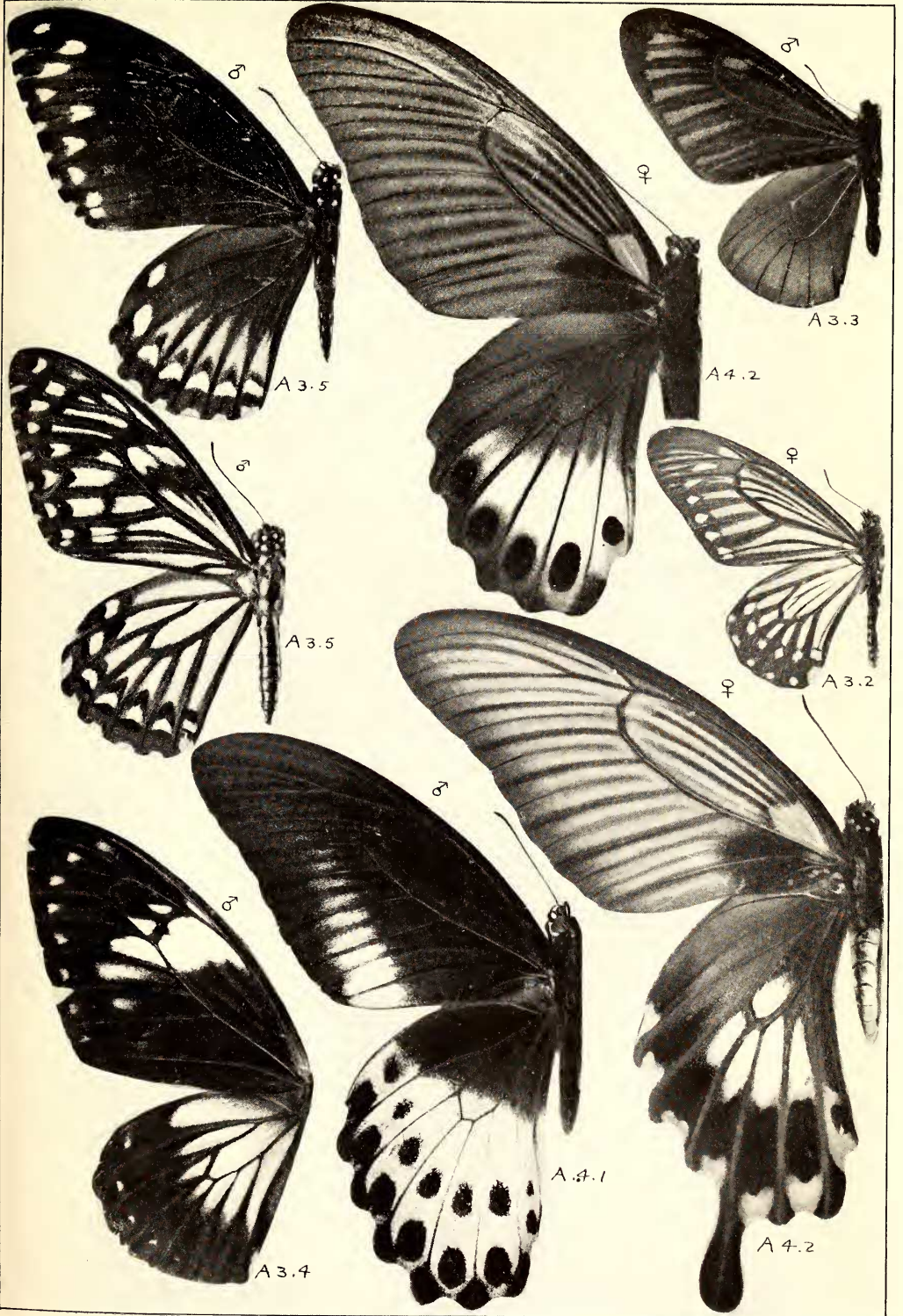
1 (2). Upf black bar across cell in continuation of v5. Uph markings between margin and cell incomplete.

a. Small. Uph margin dark chestnut, discal and postdiscal spots complete. *agestor govindra*, M. (80-100). The Tawny Mime. Kashmir—Kumaon; NR.

β. Large. Uph margin bright chestnut, postdiscal spots incomplete. Paler and bluer above.

A3. *Chilasa*.—The Mimes (Plates 1-2)—*contd.*

- * *agestor agestor*, Gray, (100-120). Sikkim—N. Burma. NR.
- 2 (1). Upf no black bar across cell. Uph prominent yellow tornal spot.
 . Unh costal margin dark up to sev as termen.
epycides epycides, Hew. (70-90). The Lesser Mime. Sikkim—N. Burma. R.
 β. Unh costal margin pale, terminal dark area ends at apex.
 * *epycides hypochra*, Jord. Shan States—Karen Hills. R.
- 3 (1b). Upf dark brown, blue spot end cell and blue discal stripes. Uph brown, prominent tornal spot.
 a. Upf discal blue stripes nearly to termen. Uph and unh usually no submarginal white markings.
 * *slateri slateri*, Hew. (80-100). The Blue striped Mime. Sikkim—N. Burma. R.
 . Upf stripes narrower and shorter. H usually with submarginal white markings.
slateri marginata, Ob. Shan States—Karen Hills. R.
 γ. Upf blue stripes only half way to termen. H always with submarginal white spots.
slateri tavoyana, But. S. Burma. R.
- 4a (1a). H. v7 very much nearer 8 than 6; dev 7-6 bowed.
- 4 (5). Unh no row yellow terminal spots. Upf submarginal whiteish spots in a regular row. Dark brown; upf blue shot. Typical form with blueish spots upf and white submarginal spots uph. Dimorphic form with upf end cell white and white discal spots; uph basal half white, black veined.
paradoxa telearchus, Hew. (120-150). The Great Blue Mime. Assam-Burma. R.
- * *v. danisepa*, But. VR.
- 5 (4). Unh prominent row yellow marginal spots. Upf submarginal white spots irregular, spot in 4 shifted in. Typical form dark-brown with white spots; dimorphic form with pale stripes.
 a. Typical form rather pale with very small postdiscal spots. Dimorphic form yellowish brown, markings wide.
clytia lankeswara, M. (90-120). The Common Mime. Ceylon. NR.
v. dissimila, Evans. NR.
 β. Typical form dark brown with prominent postdiscal spots of which the apical one may be prolonged inwards and there may be traces of a discal series. The dimorphic form has broad cream white markings typically, but in N.-E. India there is much black dusting causing the pale markings to be restricted. There is a third intermediate form with the forewing as in the first form and the hindwing with pale stripes nearly as extensive as in the second form.
 * *clytia clytia*, L. India. NR.
 * *v. dissimilis*, L. S. India—N. W. Himalayas. Pale form. NR.
v. dissimillima, Evans. N. E. India—Burma. Dark form. NR.
v. commixtus, Roth. N. E. India. VR.
 γ. First form normally with the apical spots upf enlarged into long white streaks. There are two well marked varieties—first var upf white spots absent or replaced by black spots, which may be white centred, and uph with pale streaks sometimes as extensive as in *commixtus*. Second var above dark indigo blue with obscure dusky postdiscal spots upf and uph pale streaks prominent. Dimorph *dissimillima*.
clytia onpape, M. Burma. NR.
v. janus, Fruh. R.
v. papone, Wd. R.
 δ. Second form only. Larger; upf postdiscal spots much enlarged and uph prominent yellow marginal spots.
clytia flavolimbatus, Ob. (120-130). Andamans. NR.



A. Papilionidae. 3. *Chilasa*: 4. *Papilio*.

A4. Papilio.—The Black-bodied Swallowtails (Plates 2-5).

1a (6-a). Below prominent red basal markings. Unh cell never sprinkled pale scales.

1b (4a). H width greater than half length.

1 (2.3). ♂ ♀ upf pale blue submarginal band; uph outer $\frac{2}{3}$ blue with two rows black spots. Tailless.

. ♂ upf blue band short, not above v4. ♀ blue areas strongly tinged yellow.

polymnestor parinda, M. (120-150). The Blue Mormon. Ceylon. NR.

β. ♂ upf blue band to v5 and to v7 in ♀.

* *polymnestor polymnestor*, Cr. S. India. NR.

2 (1.3). ♂ above blue scaled on a black ground on either side of each vein beyond cell; unh usually red lunules at tornus, which may be replaced by grey or may be extended to costa; tailless. ♀ in 3 forms. 1st (typical) tailless; uph a large white discal area. 2nd tailed, more or less as ♂ above; unh a white streak along dorsum. 3rd tailed, body yellow; uph usually a white spot end cell and a more or less complete row of discal white spots.

* *menon agenor*, L. (120-150). The great Mormon. Sikkim—Burma, Nicobars. C.

♀ *v. butlerianus* Roth. NR.

* ♀ *v. alcanor*, Cr. NR.

3 (1.2). ♂ tailless; black, uph a broad discal blue band. ♀ tailed, rather as *alcanor*, but tail red and white tipped.

mayo, Atk. (120-150). The Andaman Mormon. Andamans. NR.

4a (1b). H long and narrow, width not more than half length.

4 (5). ♂ ♀ alike; tail pink or white tipped. Uph elongated discal white spots in 3-4 or 2-5 and more or less complete row red lunules. Upf covered small whiteish scales. Head above and abdomen below red.

a. Uph tail red tipped. Unh red tornal area in 1 continued to base.

bootes janaka, M. (110-120). The Tailed Redbreast. Garhwal—Abor. R.

β. Uph tail white tipped and usually only 2 discal spots. Unh red tornal area not continued to base.

* *bootes bootes*, Wd. Assam. R.

γ. As last but uph 4 discal white spots.

bootes mixta, Tyl. Manipur and Nagas. R.

5 (4). ♂ tailless; black; uph blue scaled and tornal ocellus white edged. ♀ with very broad tail; upf red streak base cell; uph a large discal white patch and a prominent series double red submarginal lunules, extending to tail.

* *rhetenor*, Wd. (110-130). The Redbreast. Kumaon—Burma. NR.

♂ *v. leococelis*, Jord. Upf white tornal patch. NR.

6a (1a). Below no basal red markings.

6b (8a. 27a). Unh cell all black, not sprinkled yellow or white scales. Sexes alike. Uph blue scaled; tornal red ocellus. Tailless.

6 (7). Unh red submarginal lunules only at apex and tornus, with some discal blue scaling between. Upf no blue scaling; streaks of white scaling on either side of veins. ♂ uph prominent white streak from base under v8.

a. ♂ uph blue scaling in 6 and 7. Unf darker. ♀ browner.

protenor protenor, Cr. (100-130). The Spangle. Kashmir—Kumaon. C.

β. ♂ uph blue scaling 2-7.

* *protenor euprotenor*, Fruh. (110-140). Sikkim—N. Burma. C.

The DSF is considerably smaller than the WSF.

7 (6). Unh red submarginal lunules complete. Upf blue scaling. ♂ upf with woolly stripes on vs1, 2 and 3.

a. Head yellow and body buff at the sides. Uph no red lunules in 2 and 3.

elephenor elephenor, Db. (110-130). The Yellow-crested Spangle. Assam VR.

β. Head and body black.

A4. Papilio.—The Black-bodied Swallowtails (Plates 2-5)—contd.

elephenor schanus, *Jord.* The Black-crested Spangle. S. Shan States. VR.

8a (6b, 27a). Unh basal area including cell sprinkled white or yellow scales.

8b (16a). Above prominent green or blue bands or patches and sprinkled green scales on the black areas. Tailed.

8c (13a). Above no broad green band; may have a narrow pale or green band upf and a broad green subapical patch uph.

8 (9a). Uph green patch not prominent. Above green scaling dense. Uph submarginal green lunules. ♂ upf woolly streaks on vs 1, 2 and 3. Unf pale discal streaks short.

bianor gladiator, *Fruh.* (110-130). The Chinese Peacock. Burma. VR.

9a (8). Uph green or blue patch prominent.

9b (11a). Uph green patch of equal width in 5 and 6.

9 (10). Uph inner edge of green patch more or less straight, but ragged and rather diffused, ♂ upf woolly streaks as in last. DSF much smaller than WSF.

a. Upf green band prominent to apex. Unf pale discal streaks obscure and do not enter cell.

polyctor polyctor, *Bdv.* (90-120). The Common Peacock. Chitral-Kumaon. C.

β. Upf green band present or absent, but rarely to apex. Unf pale streaks long, enter cell and reach termen.

polyctor ganesa, *M.* (120-130). Sikkim—N. Burma. C.

γ. Upf small white spot at tornus.

polyctor significans, *Fruh.* S. Burma. NR.

10 (9). Upf inner edge green patch curved and sharp defined. Unf pale discal streaks prominent, but never reach end cell. ♂ no woolly streaks.

a. Unf discal pale streaks not to termen. Large; uph green patch large, from v3-8 and enters cell.

paris tamilana, *M.* (120-140). The Tamil Peacock. South India. NR.

β. Unf pale streaks to termen.

paris paris, *L.* (90-120). The Paris Peacock. Kumaon—Burma. C.

11a (9b). Uph blue patch much longer in 6 than in 5; red submarginal lunules prominent. ♂ no woolly streaks.

11 (12). Upf green postdiscal band. Uph blue patch enters cell and reaches termen in 6.

a. Unf pale discal streaks do not enter cell.

arcturus arius, *Roth.* (110-120). The Blue Peacock. Kashmir—Kumaon. NR.

β. Unf pale streaks enter cell. Uph blue patch in 6 broken.

* *arcturus arcturus*, *Wd.* (120-130). Nepal—Burma. NR.

12 (11). Upf narrow pale yellow discal band.

krishna, *M.* (120-30). The Krishna Peacock. Sikkim—Burma. NR.

13a (8c). Upf and uph broad green discal band.

13 (14a). Upf green band does not enter cell. Tail green tipped.

♂ with woolly streaks along vs 1, 2 and 3.

* *crino*, *F.* (80-100). The Common Banded Peacock. Ceylon. S. India—Bengal. NR.

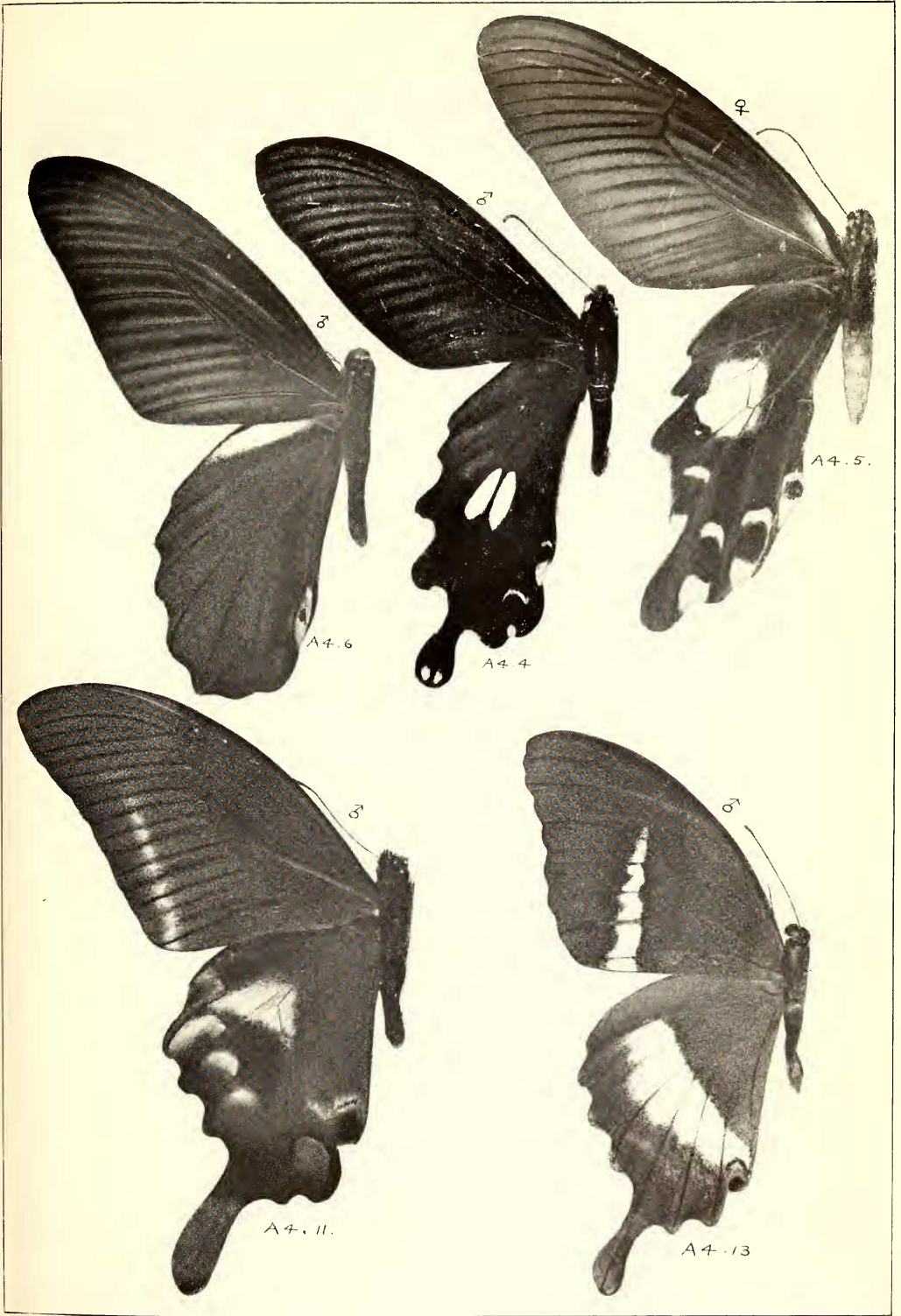
♂ v. *montanus*, *Fd.* ♂ without the woolly streaks. R.

14a (13). Upf green band enters cell. Uph yellow spot at apex. Tail black. ♂ no woolly stripes.

14 (15). Upf green band broad and broadly enters cell. Uph green discal area large, circular, enters cell.

buddha, *Wd.* (90-100). The Malabar Banded Peacock. S. India. R.

15 (14). Upf green band narrow, just enters end cell. Uph no green in 2 apical spots and tornal ocellus prominent.



A. Papilionidae. 4. *Papilio*.

A4. Papilio.—The Black-bodied Swallowtails (Plates 2-5)—cont'd.

patinurus, F. (90-100). The Burmese Banded Peacock. S. Burma. R.

16a (8b). Above no green or blue bands, patches or scales.

16b (19a). Tailless. Unf and often upf a prominent white spot end cell. Above black, covered yellow scales.

16 (17a). ♂ ♀ upf complete series equal sized submarginal white spots in a regular row. Uph postdiscal white spots short and submarginal series prominent.

dravidarum, Wm. (80-100). The Malabar Raven. S. India. R.

17a (16). ♂ upf no white submarginal spots.

17 (18). ♂ uph complete series equal sized submarginal white spots 1-6, spot in 7 smaller; submarginal row prominent. ♂ upf row of very small submarginal spots, decreasing to specks in 5-7, 8 larger; uph as ♀, spots dusky and decreasing to apex.

* *mahadeva*, M. (80-120). The Burmese Raven. Shan States—Karens. R.

18 (17). ♂ uph large discal white spots 4, 5, 6 to end cell and spot in 7 half length of spot in 6. ♂ upf with submarginal spots.

a. ♂ uph and unh discal spots only 4-7, 4 small, no submarginal spots. ♀ upf submarginal spots small; obscure discal grey streaks 1-4; uph all spaces and outer half cell dusky grey up to the dark submarginal band, bearing white crescents.

* *castor polias*, Jord. (100-130). The Common Raven. Sikkim. NR.

β. ♂ same; unh often discal spot in 3 and may be a complete row; uph traces of submarginal spots at apex. ♀ discal grey streaks absent; uph streaks white.

castor castor, Wd. Assam—N. Burma. NR.

γ. ♂ uph submarginal spots complete and sometimes the discal ones also. ♀ upf submarginal spots increasingly prominent towards apex; uph only post discal series dusky grey spots as in No. 17.

castor mehalia, Gr. S. S. Burma. R.

19a (16b). Tailed.

19b (26). Upf no prominent pale discal band from dorsum to apex.

19c (24a). Uph large white subapical patch.

19d (22a). Unh pale scales in cell arranged in 3 prominent streaks.

19e (21). Unh submarginal lunules red. ♂ upf outer half covered dense hairs, concealing yellow scaling.

19 (20). Uph white area 5-7. Unh complete row submarginal red lunules.

a. Unh blue lunules beyond the white discal spots, often continued to dorsum.

helenus mooreanus, Roth. (115-130). The Red Helen. Ceylon. NR.

β. Unh no blue lunules. Unf pale discal streaks short, do not reach termen or enter cell.

helenus daksha, M. S. India. NR.

γ. Smaller. Unf pale streaks reach termen and enter cell.

helenus helenus, L. (110-120). Mussoorie—Burma. C.

20 (19). Uph discal white area 4-7. Unh only submarginal red lunules in 1 and 2; discal blue lunules 2-4. Unf pale streaks short.

iswara, White. (130-150). The Great Helen. Mergui VR.

21 (19e). Unh submarginal lunules yellow, complete; no blue lunules; small discal yellow spots 1-3. Uph white area 4-7 and often spot base 3. Unf white spot in 1.

* *chaon chaon*, Wd. (115-130). The Yellow Helen. Nepal—N. Burma. C.

β. ♂ uph white area larger, fourth patch produced into a long point, projecting beyond the third patch.

chaon ducenarius, Fruh. S. Burma. NR.

22a (19d). Unh pale scales in cell uniformly spread.

A4. Papilio.—The Black-bodied Swallowtails (Plates 2-5)—contd.

22 (23). Uph discal white area 5-7, sometimes extending unf to 1a and 1. Unh complete row red lunules; white patch has inner edge quite straight and enters cell. Unf pale streaks short.

noblei, DeN. (110). Noble's Helen. Burma. VR.

23 (22). Uph discal white patch 4-7. Unh complete series blue lunules beyond the white patch.

fuscus andamanicus, Roth. (105-115). The Andaman Helen. Andamans. R.

24a (19c). Uph either a discal white band across the wing or a central row of white or red spots.

24 (25). ♂ ♀ alike with a discal white band uph, which is conspicuously wider in the middle. Upf no white submarginal spots. Unh submarginal lunules yellow.

hipponous pitmani, El. (90-100). Pitman's Helen. S. Burma. R.

25 (24). ♂ uph discal white band of even width; uph and unh submarginal lunules red; upf prominent marginal white spots. ♀ in 3 forms. Typical form, uph red discal spots; upf white central and apical band; resembles *hector*. 2nd form as ♂. 3rd form uph white discal spots 2-5, which may enter cell; upf pale brown outwardly with prominent black streaks between veins and no white marginal spots; resembles *aristolochie*. Very subject to aberrations.

* *polytes romulus*, Cr. (90-100). The Common Mormon. Ceylon, India. Burma. VC.

♀ v. *cyrus*, F. R.

* ♀ v. *stichius*, Hub. VC.

β. Larger. Uph ♂ marginal red lunules absent. ♀ typical form as ♂. 2nd form as *stichius*, but larger.

polytes nikobarus, Fd. (100-115). Andamans and Nicobars. C.

♀ v. *stichioides*, Evans. C.

26 (19b). Above black with a pale band across both wings; uph submarginal crescents. Unh evenly powdered white scales. ♂ upf outer half densely hairy.

a. Upf postdiscal band yellowish, macular throughout. Uph end cell on centre of the discal band.

demolion liomedon, M. (90-100). The Malabar Banded Swallowtail. S. India. R.

β. Upf pale band greenish, lower 4 spots conjoined. Uph end cell beyond the discal band.

* *demolion demolion*, Cr. The Burmese Banded Swallowtail. S. Burma. NR.

27a (6b. 8a). Unh basal area entirely yellow.

27 (28a). Tailless. Upf postdiscal yellow spots irregular. Uph base dark brown, prominent large black ringed blue spot below costa.

a. Upf discal spot 1a no larger than spot in 3. Unh black area end cell not half way to origin v7.

* *demoleus demoleus*, L. (80-100). The Lime Butterfly. Ceylon, India, N. Burma. VC.

β. Upf spot in 1a much wider than spot in 3. Unh black area end cell not half way to origin of v7.

demoleus malayanus, Wall. S. Burma. C.

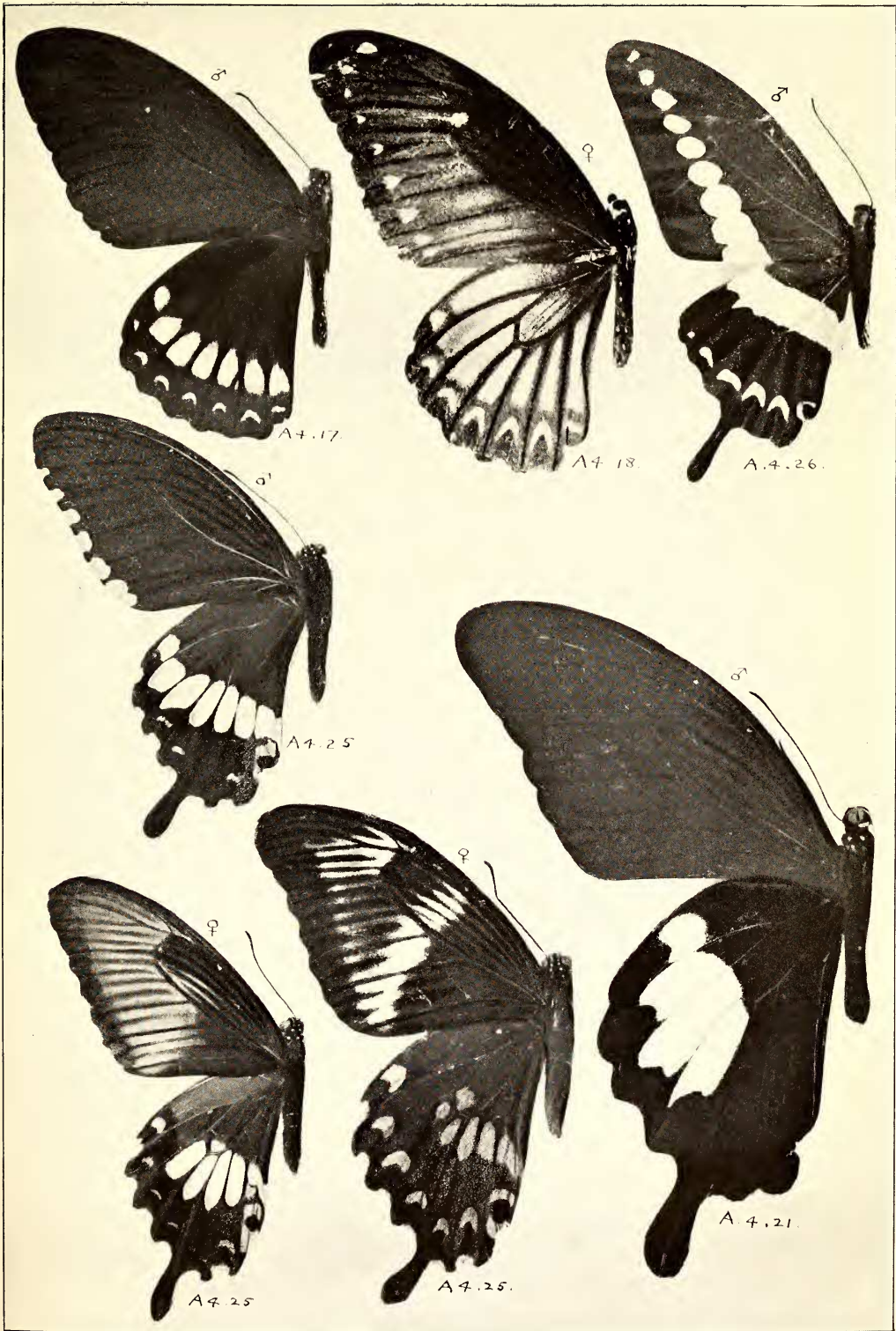
28a (27). Tailed.

28 (29a). Above veins not black; entirely yellow with narrow black bands, the discal band being blue centred.

alexanor, Esp. (75-90). The Baluchi Yellow Swallowtail. Baluchistan. VR.

29a (28). Above veins black. Upf regular row submarginal spots.

29 (30). Upf basal $\frac{1}{4}$ black, sprinkled yellow scales.



A. Papilionidae. 4. *Papilio*.

A4. Papilio.—The Black-bodied Swallowtails (Plates 2-5)—contd.

a. Uph blue lunule above tornal red spot conjoined to it ; dark discal band very near end cell.

machaon asiatica, Men. (75-90). The Common Yellow Swallowtail. Baluchistan. Chitral—Nepal. C.

v. *ladakensis*, M. Tail very short. High elevations only. R.

β. Uph blue lunule separated from tornal red spot by a black line ; discal band broader and further from cell.

machaon sikkimensis, M. Sikkim—Bhutan. NR.

γ. Uph tornal red spot very large and not black edged below ; discal band still further from end cell ; dev 6-7 broad black as well as 5-6. Above darker yellow.

**machaon verityi*, Fruh. Assam—N. Burma. R.

30 (29). Upf yellow streak from base along lower edge cell and basal $\frac{1}{4}$ cell yellow streaked, not sprinkled yellow scales. Uph yellow streak in I to base.

xuthus, L. (75-90). The Chinese Yellow Swallowtail. N. Burma. VR.

A5. Pathysa.—The Swordtails. (Plate 5).

1a (3a). Upf dark bar end cell double, enclosing 2 pale spots ; 4 dark bars in cell.

I (2). Unh central row of pale spots complete.

a. Upf 4th bar in cell from base not below mv and post discal line not to v1.

eurous cashmirensis, Roth. (60-70). The Sixbar Swordtail. Kashmir—Kamaon. NR.

β. Upf 4th bar extends along v3 and postdiscal line to v1.

eurous sikkimica, Heron. Sikkim—Assam.

2 (1). Unh central row spots consist of only a spot mid 7, end cell and in 2.

**glycerion*, Gray. (65-75). The Spectacle Swordtail. Sikkim—N. Burma. NR.

3a (1a). Upf dark bar end cell single.

3 (4a). Upf only 3 dark bars in cell ; beyond a narrow dark discal and submarginal line, the area between being triangular.

a. Upf 2nd bar from base to v1 or beyond ; discal bar to v3.

agetes agetes, Wd. (75-90). The Fourbar Swordtail. Sikkim—N. Burma. NR.

β. Upf 2nd bar from base not to v1 ; discal line meets marginal line between v2 and 3. Uph no white submarginal line in 5 and 6.

**agetes iponus*, Fruh. Tavoy—S. Burma. NR.

4a (3). Upf 4 broad dark bars in cell.

4b (6). Unh central row red spots.

4 (5). Upf row pale rounded spots on the broad dark margin, of which the second from the apex is out of line.

a. Uph dark margin does not enclose pale spot in 3 ; unh precostal spur not defined black.

**nomius nomius*, Esp. (75-90). The Spot Swordtail. Ceylon, S. India—Sikkim. NR.

β. Uph dark margin encloses pale spot in 3 ; unh precostal spur defined black. All dark markings broader.

nomius swinhoi, M. Assam—Karens. NR.

5 (4). Upf a pale green regular chain line, not spots, on the dark margin.

a. Uph no continuous central dark band.

anticrates anticrates, Db. (70-80). The Chain Swordtail. Sikkim—Assam. R.

β. Uph continuous central dark band. Markings broader.

anticrates hermocrates, Fd. Burma. R.

6 (4b). Unh no central row red spots.

A5. Pathysa.—The Swordtails. (Plate 5)—contd.

a. Upf marginal band to v1 and submarginal to v2, but do not unite; subbasal band to dorsum and 2nd from base to v1. Uph no tornal grey area.

antiphates ceylonicus, *Em.* (80-95). The Fivebar Swordtail. Ceylon. VR.

β. Upf submarginal and marginal band unite at v3 and reach dorsum. Upf grey tornal area extending as a broad band to the costa.

antiphates naira, *M.* S. India. VR.

γ. Very variable. Upf 2nd bar from base to v1; postdiscal band, if extended below v2 unites with the marginal band. Uph grey tornal area prominent but confined to tornus.

**antiphates pompilius*, *F.* Sikkim—Burma. C.

δ. All markings much broader. Upf 2nd bar from base to dorsum; discal bar curved under bar end cell as in β. Uph grey tornal area extended to costa as a broad band, but is black at apex.

antiphates epaminondas, *Ob.* Andamans. NR.

A6. Zetides.—The Bluebottles and Jays. (Plate 5).

1a (3a). Uph no submarginal row green spots.

1 (2). H long tail. Upf transparent green; black margin along costa and termen united by 4 black lines towards apex.

**cloanthus*, *Wd.* (85-95). The Glassy Bluebottle. Kashmir—Burma. NR.

2 (1). H tail very short. Black with green band across wings, which becomes macular towards the apex F.

a. Upf apical part of discal band yellowish green. Uph mv black on the discal band.

sarpedon teredon, *Fd.* (80-90). The Common Bluebottle. Ceylon, S. India C.

β. Above band broader and nearly uniformly coloured. Uph mv mostly white on the discal band. H tail shorter.

**sarpedon sarpedon*, *L.* Kashmir—Burma. C.

3a (1a). Upf row green submarginal spots.

3b (8). Upf cell spots single. Tailless.

3c (6a). Unh costal dark bar towards base not continued to origin v7 and veins on disc not black. Above markings pale bluish green.

3 (4a). Unh costal bar separated from basal dark band, bar red centred. Unh extreme end cell brown.

a. Upf costal bar coalesced to basal dark band; upf lower of 2 submarginal spots in 1 rarely present. H tooth at v4 prominent. Upf subbasal green line often absent. Uph mv thick black on the discal band.

doson doson, *Fd.* (70-80). The Common Jay. Ceylon. C.

β. Uph mv less black on inner part of discal band. H tooth v4 not prominent. Upf subbasal green line prominent.

doson eleius, *Fr.* S. India—Bengal. C.

γ. Uph costal bar separate from basal dark band. Above discal band wider. Upf 2nd submarginal spot in 1 nearly always present.

**doson axion*, *Fd.* Kumaon—Burma. C.

4a (3). Unh costal bar united to basal band; extreme end cell red.

4 (5). Upf only one submarginal spot in 1. ♂ scent wool forms a narrow stripe. Abdomen above black.

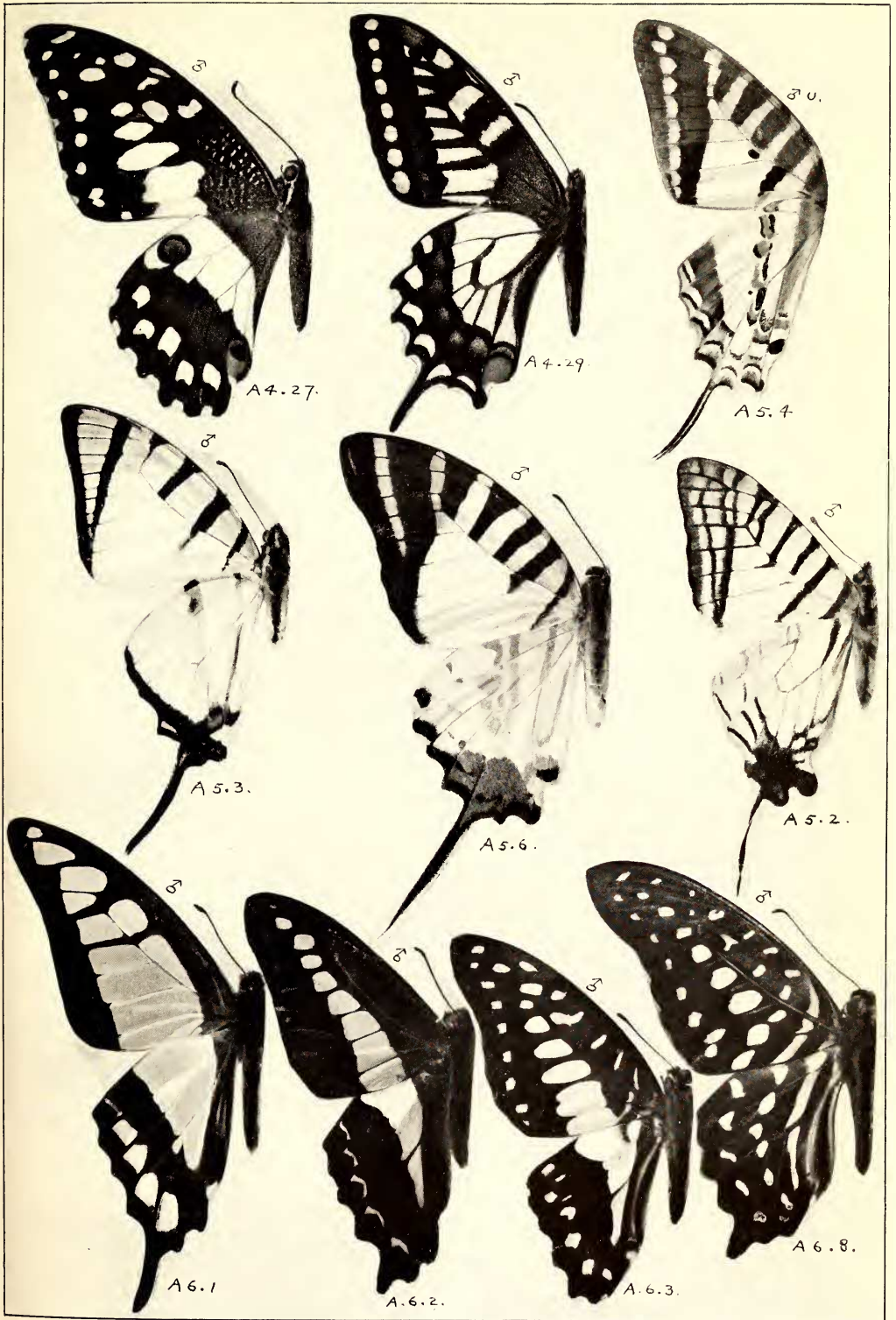
Unh costal bar red centred. Upf spot near base 5.

evemon albociliatis, *Fruh.* The Lesser Jay. Assam—Tavoy. R.

β Unh costal dark bar all black. Upf no spot near base 5.

evemon orthia, *Jord.* Mergui—S. Burma. R.

5 (4). Upf always 2 submarginal spots in 1. Unh costal bar red centred: Abdomen above whitish. Very rarely the costal bar unh is not joined to the



A. Papilionidae. 4, *Papilio*; 5, *Pathysa*; 6, *Zetides*.

A6. Zetides.—The Bluebottles and Jays. (Plate 5)—contd.

basal bar and then the basal margin of the silver band between is notched at scv.

a. Uph ends some veins black on the green band. Unh no pale spot base 3. Unf 2 submarginal spots in 7 conjoined.

eurypylus cheronus, *Fruh.* (75-90). The Great Jay. Sikkim—Burma. NR.

β. Bands above very broad and no dark veins on the band uph. Unh pale spot base 3. Unf 2 submarginal spots in 7 separate.

eurypylus macronius, *Jord.* Andamans. NR.

6a (3c). Unh costal dark bar continued to origin v7 and all veins on disc black.

6 (7). Uph cell all pale. Above pale green with broad markings. Unh costal bar all black, but spot internal to it pale yellow; discal spots orange, not red.

bathycles chiron, *Wall.* (75-100). The Veined Jay. Sikkim—Burma. NR.

7 (6). Uph cell dark with 2 green spots. Above spotted as No. 8, but smaller, markings bright green. Unh costal bar red centred and discal spots red.

arycles, *Bdv.* (70-80). The Spotted Jay. Shan States—S. Burma. R.

8 (3b). Upf cell spots double. Above black, markings small and bright green. H short tail.

a. Tail always longer.

agammemnon menides, *Fruh.* (85-100). The Tailed Jay. Ceylon, S. India. C.

β. Tail always shorter.

**agammemnon agammemnon*, *L.* Kumaon—Burma. C.

γ. Above markings much greyer green.

agammemnon andamana, *Lathy.* Andamans. C.

δ Unh 5 to 7 light red spots.

agammemnon decoratus, *Roth.* Nicobars. C.

A7. Paranticopsis.—The Zebras. (Plate 6).

1a (3). Uph discal streaks in 3,4 and 5 entire.

1 (2). Unh tornal yellow spot very small; usually dark bar in cell formed by continuation of v4. Unf discal spot just below v8 rarely present as a dot.

a. ♂ broad white stripes. ♀ as ♂, white stripes broader than the black ones.

macareus indicus, *Roth.* (80-100). The Lesser Zebra. Sikkim. NR.

β. ♀ very dark, white stripes much narrower than the dark ones.

macareus lioneli, *Fruh.* Assam. NR.

γ. ♂ white stripes narrower. ♀ as ♂ but white spots on apical half F and outer half H narrower.

macareus gyndes, *Jord.* N. Burma—Tavoy. R.

δ. ♂ white markings very broad, upper discal streak conjoined to spots beyond cell; upf cell bars broad and complete, but unf each broken into 3 spots. ♀ as β but apex F much darker and spots thereon quite white, while rest are sullied; upf discal streaks in 2 and 3 short, do not nearly reach base; cell bars much reduced.

macareus perakensis, *Fruh.* Mergui—S. Burma. R.

2 (1). Unh tornal yellow spot very large; very rarely dark bar in cell formed by continuation of v4. Upf discal spot below v8 always prominent.

a. ♀ as ♂.

xenocles phrontis, *DeN.* (85-120). The Great Zebra. Sikkim. NR.

β. ♀ much darker and pale stripes much narrower.

**xenocles xenocles*, *Db.* Assam. NR.

γ. As a but pale stripes narrower.

xenocles kephisos, *Fruh.* Burma. R.

A7. Paranticopsis.—The Zebras. (Plate 6)—contd.

3 (1a). Uph discal streaks in 3, 4 and 5 divided into small spots. All pale markings very small.

a. Upf cell spots very small and unf nearly absent.

**megarus megarus*, Wd. (65-90). The Spotted Zebra. Assam—N. Burma.

β. Upf and unf cell spots well developed.

megarus similis, Lathy. Shan States—S. Burma. R.

A8. Meandrusa.—The Hooked Swallowtails. (Plate 6).

1 (2). Below basal $\frac{1}{2}$ dark chocolate brown. ♂ above dark brown with yellow submarginal spots. ♀ broad discal white band, interrupted beyond end cell F. Apex F produced.

**gyas gyas*, Wd. (105-115). The Brown Gorgon. Sikkim—Assam. R.

β. ♂ below central area lighter. Upf spots smaller.

gyas aribbas, Fruh. Upper Burma. VR.

2 (1). Below basal area orange yellow, brown spotted. Above orange yellow yellow spotted dark brown margins upf and discal band uph. Apex F falcate.

a. Upf no discal yellow spot in 5.

**payani evan*, Db. (110-130). The Yellow Gorgon. Sikkim—Assam. NR.

β. Upf discal yellow spot in 5 and upf well defined dark brown line v3-v7 along inner edge of dark marginal area, separating off small yellow spots.

payani amphis, Jord. N. Burma—Karens. R.

A9. Teinopalpus.—The Kaiserihind. (Plate 6).

Above green, ♂ with prominent yellow upper discal area uph; ♀ with this area grey and 2 grey bands upf. Below ♂ basal half green, outer half yellow brown; ♀ mostly grey.

a. ♂ uph yellow discal area enters end cell and ends just before v3. Smaller.

**imperialis imperialis*, Hope. (90-120). The Kaiserihind. Sikkim—Assam. R.

β. ♂ uph yellow discal area scarcely enters end cell and ends on v2. ♀ uph darker, yellow dorsal area to v3.

imperialis imperatrix, DeN. N. Burma—Karens. R.

A10. Leptocircus.—The Dragontails. (Plate 6).

1 (2). Above band white, constricted on upf towards centre. Tarsal claw with a tooth. ♂ with scent organ.

curius, F. (40-50). The White Dragontail. Assam—Burma. NR.

2 (1). Above band green and black band beyond of nearly even width throughout. Tarsal claw simple. ♂ no scent organ.

a. Unh white band along dorsum towards tornus ill defined and widely separated from latter.

meges indistincta, T'yt. (40-55). The Green Dragontail. Assam—N. Burma. NR.

β. Unh white band along dorsum towards tornus well defined and closer to latter.

**meges virescens*, But. Karens—S. Burma. C.

All. Armandia.—The Bhutan Glory. (Plate 6).

Above black with narrow white lines; uph tornus with 2 or 3 blue and white ocelli on a black area, crowned by a large red area, which is posteriorly yellow. Long tail at v4, short tails at vs 2, 3 and 5.

**lidderdalei*, Ath. (90-110). The Bhutan Glory. Bhutan, Naga and Chin. Hills. R.



A. **Papilionidae.** 7. *Paranticopsis*; 8. *Meandrusa*; 9. *Teinopalpus*; 10. *Leptocircus*; 11. *Armandia*; 12. *Hypermmestra*; 13. *Parnassius*.

A12. Hypermnestra.—The Desert Apollo. (Plate 6).

Above cream white. Upf black spot in and at end cell; just beyond cell double, black ringed, red spot. Unh white with irregular greenish patches and obscure red spots base costa and on disc.

**helios balucha*, M. (45-55). The Desert Apollo. Baluchistan.

A13. Parnassius.—The Snow Apollos. (Plate 6).

The spotting and venation very variable and no single character can be taken as absolutely reliable.

1a (4a). F v7 ex 6; 10 and 11 free. Antennæ white ringed. Unh red basal spots complete; uph never blue spots. Upf usually 2 red spots end cell, red spot mid 1 and no connecting dark area or band. Uph red spot base 7; 3 discal red spots, viz., mid 7 between vs4-6, in 1-2, latter being more often black above; submarginal row black lunules. ♀ pouch brown, boat shaped below, pointed in front.

1b (3). ♀ pouch posteriorly keeled. Upf cilia not or hardly chequered; vitreous dark marginal area very wide, as wide or wider than the submarginal white and post discal black bands together.

1 (2). Very large with large red spots.

discobolus, Alph. (70-80). The Larger Keeled Apollo. Chitral. R.

2 (1). Smaller.

a. Small and very white, very little black scaling.

jacquemontii chitralensis, M. (55-70). The Keeled Apollo. Chitral. NR.

β. Large; often much black scaling; sometimes yellowish.

jacquemontii jacquemontii, Bdv. (65-75). Kashmir—Kumaon. R.

3 (1b). ♀ pouch not keeled. Upf cilia prominently chequered; vitreous dark marginal area narrow.

a. Comparatively large and white.

**epaphus epaphus*, Ob. (50-60). The Common Red Apollo. Chitral—Kumaon. NR.

β. Small and dark.

epaphus sikkimensis, El. (40-50). Sikkim. C.

4a (1a). F v7 not ex 6. Antennæ black, not white ringed, but sometimes scaled yellow or whitish;

4b (7a). F vs 10 and 11 not anastomosed, but may touch.

4 (5a). F vs 6 and 7 from a point and origin v10 far removed. Uph complete submarginal row blue and white centred black spots on a white ground, though margin may be blackish. Unh prominent red basal spots. Upf spots end cell and mid 1 usually red but not joined by a dark band. Uph not as a rule a red spot base 7; remaining discal spots prominent. Unh submarginal spots greenish. Two broods, DSF pale, WSF dark. ♀ pouch white, like a cylinder squashed in at the sides and the projecting lower portion then dented.

a. Comparatively large.

**hardwickei hardwickei*, Gray. (55-65). The Common Blue Apollo. Chitral—Kumaon. C.

β. Smaller.

hardwickei viridicans, Fruh. (50-60). Sikkim. C.

5a (4). F vs 6 and 7 separate at the base; usually bases 6, 7 and 10 equidistant. Upf spots end cell and mid 1 black and joined by a dark band. Uph blue centred black submarginal spots in at least 2 and 3; beyond to costa there may be a complete series of similar spots or a dark wavy line.

5 (6). Comparatively small. Unh basal red spots obsolete. Uph no red spot base 7 and discal spots not white centred. ♀ pouch surrounds end abdomen, like a cylinder squashed flat from below and the end split, resulting in 2 divergent points.

A13. Parnassius.—The Snow Apollos. (Plate 6)—contd.

a. H angled at v7. Upf discal band obsolete; postdiscal dark band in ♂ not to dorsum. Uph discal spots 5 and 7 prominent red, equal sized; spots 1 and 2 obsolete; only blue submarginal spots in 2 and 3; marginal dark area faint.

delphius kafir, *Avin.* (55-65). The Kafir Banded Apollo. Safed Koh—Kafiristan. VR.

β. Upf postdiscal and discal bands conjoined in 3. Uph discal red spot in 5 prominent; 7 smaller black or red; only blue spots in 2 and 3.

delphius chitralica, *Ver.* The Chitral Banded Apollo. Chitral. VR.

γ. Very washed out pale form with reduced markings. Upf no discal band or spot in 1. Uph no discal spot in 7; spot in 1 small and black; margin dark; only blue spots in 2 and 3 and the wavy line beyond obsolete.

delphius hunza, *Groum.* The Hunza Banded Apollo. Hunza. VR.

δ. Upf discal and postdiscal bands narrow, complete, sharp defined. Uph discal spot 5 prominent, spot mid 7 black, just indicated or absent; submarginal blue spots usually complete and on dark area, which does not reach the margin, but sometimes there are only blue spots in 2 and 3 with a dark wavy line beyond; discal spots 1 and 2 often red and usually indicated.

delphius nicevillei, *Avin.* The Astor Banded Apollo. Astor, Western Kashmir. R.

η. Upf much as last, may be washed out looking in ♀. Uph discal red spot 5 very large, from v4-6, spot mid 7 small, black: always discal red spots 1 and 2; submarginal blue spots complete and on a dark ground that reaches the margin.

delphius atkinsoni, *M.* The Pir Panjal Banded Apollo. E. and S. Kashmir. VR.

ξ. Upf postdiscal dark band very broad, as broad as marginal dark band; white submarginal spots small and end at v2; discal band often incomplete posteriorly. Uph discal spot in 5 variable; spot in 7 usually absent; submarginal blue spots complete and on a broad dark area to margin; discal spots in 1 and 2 prominent or absent.

delphius stoliczana, *Fd.* The Ladak Banded Apollo. Ladak—Kulu. VR.

ε. Upf very white with narrow complete bands. Uph basal black scaling up to inner edge of discal spots 5 and 7, which are red and equal; no spots 1 and 2; submarginal blue (sometimes black) spots in 2 and 3 only and wavy line beyond prominent; margin white.

delphius lampidius, *Fruh.* The Sikkim Banded Apollo. Sikkim. VR.

θ. As last but much larger and very dark. Upf almost completely black scaled and uph black scaled to outer edge of discal spots, which are small and equal; margin narrow black.

delphius latonius, *Bryk.* (55-65). The Thibet Banded Apollo. Sikkim—Phari Jong. VR.

6 (5). Large. Unh basal red spots prominent. Uph red spot base 7. Above general tone yellowish. Upf black bands broad, complete, considerable black scaling. Uph discal spots 5 and 7 large, white centred; from spot in 5 a black band to dorsum; submarginal blue spots 2 and 3 large and wavy line to costa broad; margin broadly pale. ♀ pouch as last, but sides broken and separated from body.

imperator augustus, *Fruh.* (80-90). The Imperial Apollo. Sikkim. VR.

7a (4b). F vs 10 and 11 anastomosed.

7b (10). F vs 10 and 7 well separated at base, 7 and 6 approximate. Comparatively small. Uph all submarginal spots black. Uph discal band more or less complete, no red spots.

7 (8a). Upf cilia black. Uph always small red discal spots 5 and 7, no spot base 7; unh red basal spots. ♀ pouch black with 2 long contiguous points.

A13. Parnassius.—The Snow Apollos. (Plate 6)—contd.

a. Upf marginal dark area broad; postdiscal band prominent; discal band slender. Uph discal spots small; sub-marginal spots small and separate; margin narrowly dark.

simo simo, Gray. (45-55). The Black-edged Apollo. Ladak. VR.

β. Upf marginal dark area reduced to a thin line, thickened at ends veins; white submarginal spots and postdiscal dark band very broad. Uph black spot in 7 behind the red spot; from discal spot in 5 a more or less complete black band to dorsum; submarginal black band broad and continuous, margin white with black veins. VR.

simo acconus, Fruh. Sikkim.

8a (7). Upf cilia pale yellow or white. ♀ pouch white, hangs down as a pendulous bag, squashed flat at the sides.

8 (9). Above very white no red spots at all. Very small. Upf discal band more or less complete; postdiscal dark band, submarginal white spots and marginal dark band all of equal width. Uph discal spots 5, mid 7 and base 7 small and black: more or less continuous discal band from 7 to dorsum; basal black scaling very reduced; submarginal spots small, well separated, margin white.

hannyngtoni, Avin. (40-45). Hannyngton's Apollo. Sikkim—S. Thibet. VR.

9 (8). Uph with red spots.

a. As *β* but very washed out.

acco acco, Gray. (40-60). The Varnished Apollo. Ladak. VR.

β. Upf white submarginal spots unusually sharp, veins broadly black especially 2, 3 and 4. Uph prominent red spot 5, mid 7, base 7 and a black spot in between the two latter; spot in 5 joined to dorsum by a black band and usually a black spot between 5 and 7; submarginal spots prominent, well separated, margin narrowly black. Unh has a varnished yellow appearance, concealing the basal red spots except that in 7.

acco, gemmifer, Fruh. (45-65). Sikkim. VR.

10 (7b). Very large. F v10 ex 7; 6 and 7 well separated at origin. Upf discal band usually broadened below cell, bases 2 and 3 usually entirely black; no red spot. Uph no spot base 7, small red or black spot mid 7; very large red spot extending from v4-6, usually white centred and a red or black basal bar in 1-2; complete row blue centre black submarginal spots on a dark ground margin narrowly dark. ♀ pouch very large, cornute. Unh red basal spots obscure.

**charltonius, Gray.* (80-90). The Regal Apollo. Chitral—Kumaon. R.

Notes on the *Papilionidae*. The genera *Troides* to *Meandrusa* are usually dealt with under *Papilio*, which genus Moore split-up into numerous genera; the genera adopted here appear natural and easily recognisable.

The following are new names:—*zaleucus* ♂ v. *punctata*; *alcinous tytleri* (= *mpediens, Tyt nec Roth*) *clytia* v. *dissimila* and *dissimillima*.

It is questionable whether *rhodifer* should not be regarded as a race of *con* and *polymnestor* and *mayo* as races of *memnon*. *mahadeva* may be a dimorphic form of *castor m'hala*.

Additional races have been described for many of the species, more especially in the genus *Parnassius*; I have only included what appear to me to be really well defined races. Aberrations and infrequent varieties have been omitted.

Byasa sycorax (A 2-4) has not been recorded from India before. A specimen was obtained in the Mergui District by Mr. G. R. E. Cooper in April 1922. A specimen of *Troides amphrysus* (A 1-5) has recently been received from Mergui by Mr. O. C. Ollenbach.

Note on plates.—The number under each figure in the plates is that given in the keys, where a star indicates that the insect has been figured.

Note on rarity.—VC=very common. C=common. NR=not rare. R=rare. VR.=very rare.

B. Pieridæ. The Whites. Genera Key.

1a (3a). F v5 ex 6; v9 absent. H precostal straight, directed back. Palpi slender, hairy.

1 (2). F v8 absent; upper apex of cell acute, dcvs concave, H v8 as long as cell. Antennæ club slender.

Leptosia, Hub. The Psyche. (Plate 7).

2 (1). F v8 present, very short; upper apex of cell obtuse, dcvs nearly straight, H v8 half as long as cell. Antennæ club spatulate.

Baltia, M. The Dwarf Whites. (Plate 7).

3a (1a). F vs 5 and 6 separate at origins.

3b (17a). F v6 ex 7 from well beyond end cell.

3c (14a). H with well developed precostal vein.

3d (11a). Palpi slender, hairy, third joint usually long.

3e (9a). F dcv 5-6 not angled.

3 (4a). F upper apex cell acute; vs 5 and 6 approximate at origin, dcv 5-6 short and may or may not be in line with dcv 4-5; v10 from upper end cell; v8 comparatively long; v9 present or absent. H precostal straight. Antennæ with stout club.

Synchloe, Hub. The Little Whites. (Plate 7).

4a (3). F upper apex cell obtuse; v9 absent. H precostal curved forward.

4 (5a). F v8 very short, hardly visible and may be absent; v10 usually from well before end cell and dcv 5-6 unusually long, but first group are transitional to last genus. Antennæ club stout.

Pieris, Schrank. The Bath and Cabbage Whites. (Plate 7).

5a (4). F v8 comparatively long and prominent.

5b (8). F v11, if present, free from 12.

5c (7). F costa smooth.

5 (6). F v11 present. Antennæ club stout.

Aporia, Hub. The Blackveins. (Plate 7).

6 (5). F v11 absent. Antennæ club slender.

Delias, Hub. The Jezabels. (Plate 7).

7 (5c). F costa serrate in ♂; v11 present. Antennæ club slender.

Prioneris, Wall. The Sawtooths. (Plate 8).

8 (5b). F v11 anastomosed to v12. Antennæ club slender.

Anaphæis, Hub. The Pioneer. (Plate 7).

9a (3e). F dcv 5-6 angled; v10 well before end cell; 11 and 8 present, 9 absent. H precostal well curved forward. Antennæ club slender.

9 (10). ♂ no abdominal hair pencils. F apex not produced, termen straight or convex.

Huphina, M. The Gulls (Plate 8).

10 (9). ♂ (except *lalassis*) with abdominal hair pencils. Apex F usually produced and may be falcate, termen usually concave.

Appias, Hub. The Puffins and Albatrosses. (Plate 8).

11a (3d). Palpi scaled, short and stout, third joint very short. F v10 from just before end cell.

11 (12a). H precostal short and lumpy. F apex lies between vs7 and 8. ♂ uph white brand base 7; unfl tuft white hairs towards base dorsum.

Catopsilia, Hub. The Emigrants. (Plate 9).

12a (11). H precostal slender, curved back.

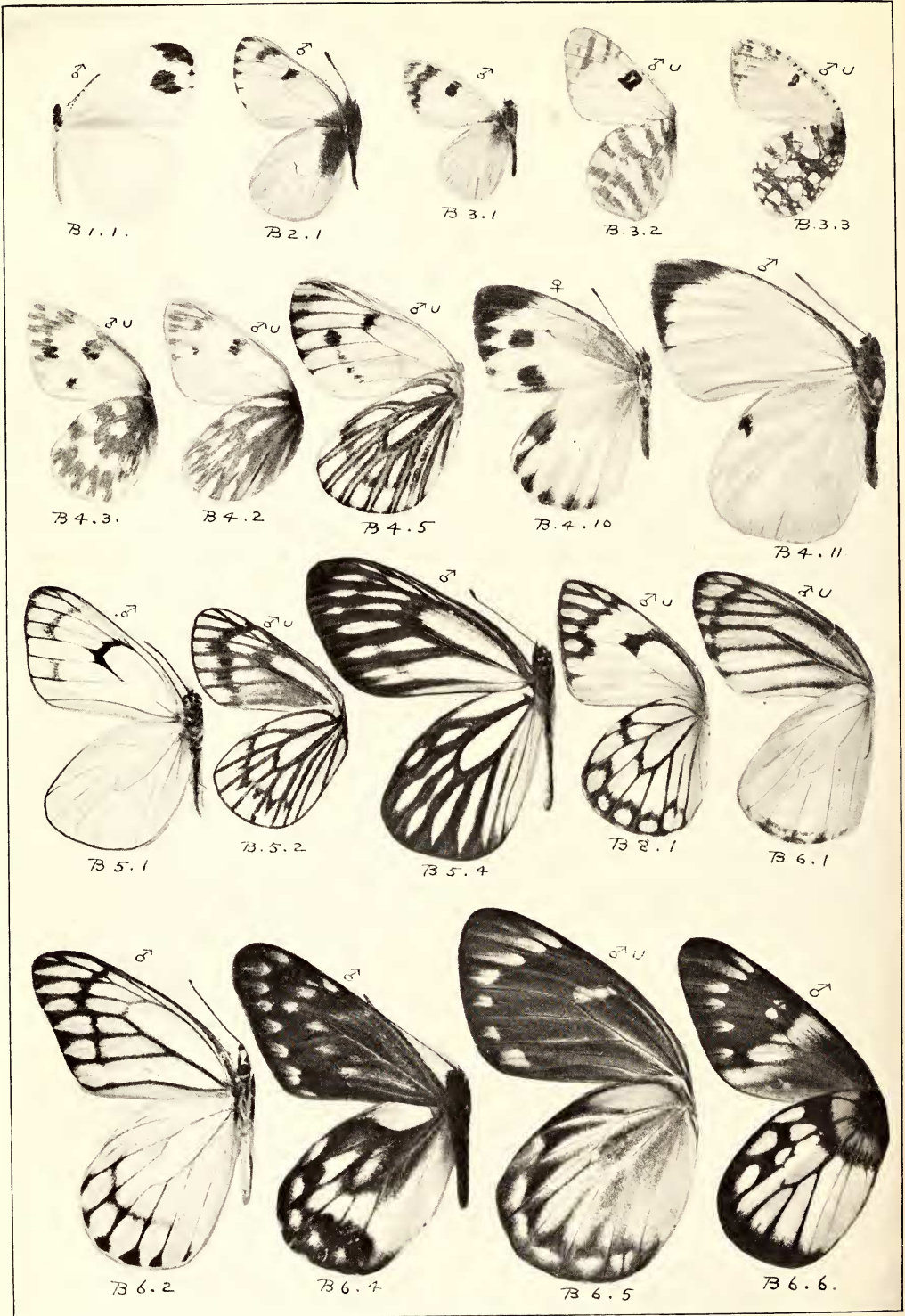
12 (13). F apex at end v7. H rounded v7 well before end cell; dcv 7-6 inclined.

Gandaca, M. The Tree Yellow. (Plate 9).

13 (12). F apex between vs 6 and 7, falcate or pointed.

Dercas, Db. The Sulphurs. (Plate 9).

14a (3b). H no precostal vein.



B. Pieridae. 1. *Leptosia*: 2. *Baltia*: 3. *Synchloe*: 4. *Pieris*: 5. *Aporia*: 6. *Delias*: 8. *Anaphaeis*.